

WHAT IS CLAIMED IS:

1. A thin film structure, comprising:
a substrate; and
an annealed thin film layer on said substrate, said annealed thin film layer including a magnetic material and an oxide material, wherein the annealing of said annealed thin film layer effects the exchange coupling between the grains of said magnetic material.
2. The thin film structure of claim 1, wherein said annealed thin film layer is annealed for a period of time in the range of about 30 seconds to about 30 minutes.
3. The thin film structure of claim 1, wherein said annealed thin film layer is annealed at a temperature in the range of about 200 °C to about 700 °C.
4. The thin film structure of claim 1, wherein said magnetic material includes at least one of Fe, Co, Ni, or alloys thereof with Pt, Cr, Pd or Sm.
5. The thin film structure of claim 1, wherein the grains of said magnetic material have a size in the range of about 3nm to about 50nm.
6. The thin film structure of claim 1, wherein said oxide material includes at least one of Al₂O₃, NiO, Sm₂O₃, ZrO₂, TiO₂, SiO₂, HfO₂, CoO, Co₂O₃ or CrO₂.
7. The thin film structure of claim 1, wherein said annealed thin film layer is structured and arranged for data storage.
8. A magnetic recording medium formed on a substrate, comprising:
an underlayer on the substrate; and
a magnetic recording layer on said underlayer, wherein said magnetic recording layer is annealed to effect the exchange coupling between grains of said magnetic recording layer.
9. A method for effecting exchange coupling in a thin film, comprising:
heat treating the thin film to effect exchange coupling between grains that form the thin film.
10. The method of claim 9, wherein the heat treating is performed for a period of time in the range of about 30 seconds to about 30 minutes.
11. The method of claim 9, wherein the heat treating is performed at a temperature in the range of about 200 °C to about 700 °C.

12. The method of claim 9, wherein the heat treating is a vacuum anneal process or a rapid thermal anneal process.
13. A method for forming a thin film, comprising:
depositing a thin film layer on a substrate; and
annealing the thin film layer to effect exchange coupling in the thin film layer.
14. The method of claim 13, wherein the depositing of the thin film layer includes co-depositing a magnetic material and an oxide material.
15. The method of claim 14, wherein the effected exchange coupling occurs between grains of the magnetic material.
16. The method of claim 15, wherein the effect on exchange coupling is an increase in the exchange coupling between grains of the magnetic material.
17. The method of claim 13, wherein the annealing is performed for a period of time in the range of about 30 seconds to about 30 minutes.
18. The method of claim 13, wherein the annealing is performed at a temperature in the range of about 200 °C to about 700 °C.
19. A thin film magnetic structure made according to the method of claim 13.
20. A magnetic recording medium including a thin film magnetic structure made according to the method of claim 13.